WHAT IS CLAIMED IS:

1. An adaptive equalizer, comprising:
an input delay line including delay elements, the input delay line configured to receive an input signal and provide intermediate signals, wherein intermediate signals are shifted representations of the input signal;

(a first output delay line including a delay element, the first output delay line configured to receive a first intermediate signal and provide a first gradient element for computing a first coefficient multiplier;)

a second output delay line configured to receive intermediate signals and use the first coefficient multiplier to combine intermediate signals into an equalized output signal.

2. The adaptive equalizer of claim 1, wherein the first output delay line provides the first gradient element for computing the first coefficient multiplier when a first switch associated with the first gradient element is selected.

3. The adaptive equalizer of claim 1, wherein the shifted representations of the input signal are time shifted representations of the input signal.

4. The adaptive equalizer of claim 2, wherein the first output delay line is operable to receive a second intermediate signal and provide a second gradient element for computing a second coefficient multiplier when a second switch associated with the second gradient element is selected.

5. The adaptive equalizer of claim 3, wherein the first output delay line is configured to provide a first gradient element before the second gradient element.

6. The adaptive equalizer of claim 3, wherein the first output delay line is configured to provide a second gradient element before the first gradient element.

7. The adaptive equalizer of claim 2, further comprising:
a third output delay line operable to receive a second intermediate signals and provide a second gradient element for computing a second coefficient multiplier.

8. The adaptive equalizer of claim 1, wherein the adaptive equalizer is operable to implement least mean square adaptive equalization, signed least mean square equalization, and sign-sign least mean square adaptive equalization.

9. The adaptive equalizer of claim 1 implemented using CMOS.

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10. The adaptive equalizer of claim 1, wherein each coefficient multiplier is initially set to equal one.

11. The adaptive equalizer of claim 1, wherein the gradient elements are components of a gradient vector.

12. An equalizer, comprising:

an input delay line including delay elements, the input delay line configured to receive an input signal and provide intermediate signals, wherein intermediate signals are shifted representations of the input signal;

a first output delay line including delay elements and switches configured to receive intermediate signals, the first output delay line operable to provide gradient elements for computing coefficient multipliers, wherein a first gradient element is provided for computing a first coefficient multiplier when a first switch associated with the first gradient element is selected;

a second output delay line including delay elements and coefficient multipliers configured to receive intermediate signals, wherein the plurality of coefficient multipliers are operable to alter intermediate signals using the plurality of coefficient multipliers calculated using the gradient elements provided by the first output delay line.

13. The filter of claim 12, wherein a second gradient element is provided for computing a second coefficient multiplier when a second switch associated with the second gradient element is selected.

14. The filter of claim 13, wherein the coefficient multipliers associated with the variable amplifiers are updated after the plurality of gradient elements are provided.

15. The filter of claim 13, wherein the coefficient multipliers associated with the variable amplifiers are updated after the gradient vector is determined.

16. The filter of claim 13, wherein the filter is implemented using CMOS.

17. An optical switch, comprising:

an optical receiver;

adaptive equalization circuitry coupled to the optical receiver, the adaptive equalization circuitry comprising:

an input delay line including delay elements, the input delay line configured to receive an input signal and provide intermediate signals, wherein intermediate signals are shifted representations of the input signal;

a first output delay line including delay elements and switches configured to receive intermediate signals, the first output delay line operable to provide gradient elements for computing coefficient multipliers, wherein a first gradient element is provided for computing a first coefficient multiplier when a first switch associated with the first gradient element is selected;

a second output delay line including delay elements and coefficient multipliers configured to receive intermediate signals, wherein the plurality of coefficient multipliers are operable to alter intermediate signals using the plurality of coefficient multipliers calculated using the gradient elements provided by the first output delay line.

18. The optical switch of claim 17, wherein a second gradient element is provided for computing a second coefficient multiplier when a second switch associated with the second gradient element is selected.

19. The optical switch of claim 18, wherein the coefficient multipliers associated with the variable amplifiers are updated after the plurality of gradient elements are provided.

20. The optical switch of claim 18, wherein the coefficient multipliers associated with the variable amplifiers are updated after the gradient vector is determined.